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Stokes coefficients and wave resistance

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Abstract

© 2015, Pleiades Publishing, Ltd. With the help of the Hamilton variational principle an infinite chain of compactly written quadratic equations with respect to the Stokes coefficients determining the periodic progressive finite-depth waves is constructed. An efficient algorithm of calculation of these coefficients in the form of series in terms of wave-amplitude powers is given. In analytical form, a ten-term expansion in terms of the amplitude for the wave-resistance force arising from motion under the free surface of a two-dimensional body generating the waves is constructed. The obtained expansion is compared with the Kelvin formula, which is single-term in amplitude, and with an accurate numerical solution.

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